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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,966	01/16/2004	Diane K. Stewart	F125	6517

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EXAMINER	
OLSEN, ALLAN W	
ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 09/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/758,966	STEWART ET AL.	
	Examiner	Art Unit	
	Allan Olsen	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/23/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the reference sign "50" that was mentioned on page 15 of the specification.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because figure 12 includes the reference characters 43 and 62 that are not mentioned in the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and In *re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-3, 13-17 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 23-25 of copending Application No. 10/664,247. Although the conflicting claims are not identical, they are not patentably distinct from each other because the variations in wording are slight and the claims are clearly directed to essentially the same process.

The co-pending '247 application does not claim a quartz substrate. It would have been obvious to one skilled in the art to use a quartz substrate because the claims of the '247 application are directed to a process that increases the transparency of a lithography mask by repairing opaque defects and the use of quartz as the transparent substrate of a lithography mask is so common that one skilled in the art would immediately envisage quartz as the transparent substrate material claimed in '247.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6-8, 10-19, 21 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication 20030047691 of Musil et al. (hereinafter, Musil).

Musil teaches repairing opaque defects of a lithography mask by directing an electron beam and XeF_2 toward a region of a quartz substrate into which Ga^+ ions have been implanted (see paragraphs [0047]-[0049]).

Regarding the process parameter limitations of claims 10-12, 18 and 19 and the process results limitations of claims 6-8, 21 and 22, it is noted that Musil does not explicitly teach these limitation. However, Musil provides information regarding related operational parameters and Musil teaches process results indicating that Musil operates in a manner that meets these limitations. Specifically, Musil teaches repairing a mask by electron beam assisted etching in a manner such that the quartz substrate is not damaged. As Musil obtains results that meet the process result limitations of claims 6-8, 21 and 22, it follows that the operational parameters used by Musil are comparable to

those of claims 10-12, 18 and 19. Additionally it is noted that Musil teaches minimizing the amount of electron charge used to remove defects ([0053]).

Claims 1-22 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by US Patent Application Publication 2004/0151991 of Stewart et al.

Stewart incorporates by reference the teachings of Musil. Additionally, Stewart teaches (with emphasis added):

"[0036] Mask repair can use both electron beam and ion beam etching and deposition. In embodiments in which it is not desired to use ion implantation staining, an electron beam repair is preferred because it eliminates ion implantation. For example, MoSi and TaN.sub.2 absorber material can be etched using an electron beam and an etchant gas, such as XeF.sub.2, as described in **U.S. patent application Ser. No. 10/206,843 for Electron Beam Processing," by Musil et al., which is hereby incorporated by reference.** The gallium beam can be also be used for etching chrome, and **the gallium-implanted layer can be removed using the gas assisted etching using the ion beam or an electron beam."**

[0038] A strategy to repair a particular defect can include multiple stages, using combinations of ion, electron or lasers. For example, **an ion beam can be used to remove an opaque defect and then an electron beam can be used to etch a layer of gallium-implanted quartz using XeF.sub.2 as post processing to restore transmission.**

[0044] In accordance with various repair strategies that can be used, a work piece can be processesed using an electron beam or an ion beam. The effects of **ion implantation can be**: 1. avoided by using an electron beam for some operations; 2. used constructively to provide desired optical properties; or 3. **eliminated by removal of the implanted layer.** Multi-stage operations that use a combination of laser beams, ion beams, and electron beams can speed operations and reduce defects. For example, **an ion beam can be used to process a defect and then an electron beam can be used to remove the effects of the ion beam.**

The references applied above have a common inventor with the instant application. Based upon the earlier effective U.S. filing date of these references, they constitute prior art under 35 U.S.C. 102(e). These rejections under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the references was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Response to Arguments

Applicant's arguments filed June 20, 2006, have been fully considered but they are not persuasive.

Applicant argues that Musil does not teach:

"'restoring the transparency of a quartz material having implanted gallium' as recited in claim 1 or 'restoring the transparency of the substrate of a transparent substrate having an implanted material that reduces the transmission of the substrate' as recited in claim 13."

In response, the examiner, like applicant, cites paragraph [0048] of Musil, which reads:

> *[0048] In optional step 512, a focused ion beam, with or without an etch enhancing gas, can be used to remove a portion of the excess material defect, leaving preferably approximately 20-40 nm of material to be removed with the electron beam in step 514 and 516. By removing most of the defect layer using the focused ion beam, the defect is removed more quickly because the etch rate of the ion beam is typically greater than that of the electron beam. The gallium atoms from the focused ion beam typically implant in the target to a depth of between 20-40 nm. By leaving approximately that thickness of material unetched by the ion beam and then using the electron beam to remove the remaining material, little or no gallium will be implanted into the mask itself. If step 512 is used, step 503 is not necessary, and a step of locating the defect area to be scanned is performed before the ion beam is scanned. Separate steps for imaging and drawing a repair box may be needed for the ion beam and electron beam because the beams may not be perfectly aligned.*

Applicant's characterization of [0048] excludes the possibility of Ga implantation into the quartz substrate. However, the examiner's take on [0048] is slightly different. The examiner maintains that [0048] allows for some amount, albeit a small amount, of Ga implantation into the quartz. Furthermore, the examiner considers a metal-coated quartz substrate to be opaque (i.e., non-transparent). Therefore, a process that repairs an opaque defect on a quartz substrate is considered to be a process that restores transparency to the quartz substrate. As [0048] teaches using an electron beam and a

reactive gas beam to repair an opaque defect in a Ga implanted mask, [0048] is considered to meet the limitations of claims 1 and 13. It is worth noting that the examiner does not consider claims 1 and 13 to necessarily be limited to a process wherein the transparency of a Ga implanted substrate is restored by the removal of the implanted Ga.

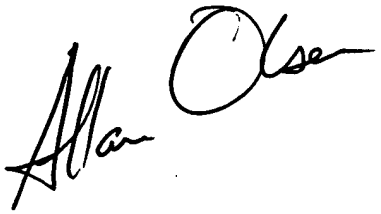
Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sugiyama, US Patent Application Publication 2004/0131953, discloses and claims subject matter that is very similar to applicant's invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 571-272-1441. The examiner can normally be reached on M, W and F: 1-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Allan Olsen
Primary Examiner
Art Unit 1763